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ning of each regular issue of the PCT Gazette.*

(54) Title: MICROFLUIDIC AND NANOFLUIDIC ELECTRONIC DEVICES FOR DETECTING CHANGES IN CAPACITANCE OF FLUIDS AND METHODS OF USING

(57) Abstract: The present invention relates to microfluidic and nanofluidic devices for detecting or measuring an electrical property of a fluid including a liquid or aerosol, a single molecule or a single particle or cell in a fluid. In a particular embodiment, the devices detect or measure changes in capacitance of a fluid, molecule, particle or cell as it passes through the device. The present invention also relates to the detection and measurement of single molecules, in particular, biological molecules. The present invention also relates to methods of sequencing polynucleotide molecules, such as RNA or DNA, by detecting differentially labeled single nucleotides. Applications of this technology of single molecule detection, includes DNA or RNA sequencing which require a resolution of 3-5 nucleotides, detection of SNPs which require a single nucleotide resolution, proteomics which require 3 nucleotide resolution, and particle sizing. The microfluidic device can be used to determine the DNA content of cell, to analyze cell-cycles kinetics of populations of cells and as an assay for abnormal changes in DNA content of cells. The nano-microfluidic devices of this invention also have utility for use as detectors in molecular sorting systems and detecting of pathogens and spores. The present invention is also referred to as "Capacitance cytometry".

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